1. Solve the quadratic equation below. Then, choose the intervals that the solutions x_1 and x_2 belong to, with $x_1 \leq x_2$.

$$20x^2 + 69x + 54 = 0$$

A. $x_1 \in [-45.52, -43.94]$ and $x_2 \in [-24.15, -23.84]$

B. $x_1 \in [-2.64, -1.75]$ and $x_2 \in [-1.36, -1.19]$

C. $x_1 \in [-6.99, -6.27]$ and $x_2 \in [-0.45, -0.38]$

D. $x_1 \in [-9.98, -8.56]$ and $x_2 \in [-0.34, -0.25]$
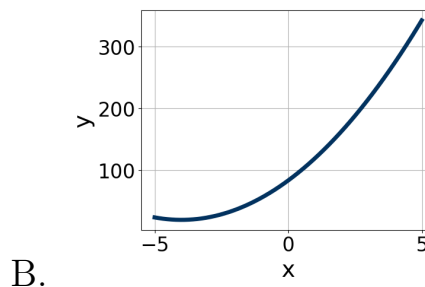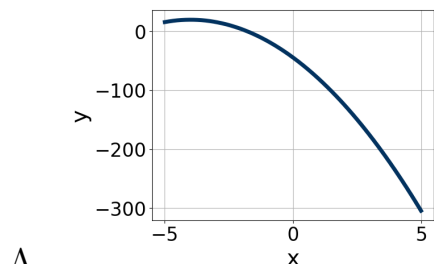
E. $x_1 \in [-4.51, -2.44]$ and $x_2 \in [-0.85, -0.68]$

2. Factor the quadratic below. Then, choose the intervals that contain the constants in the form $(ax + b)(cx + d); b \leq d$.
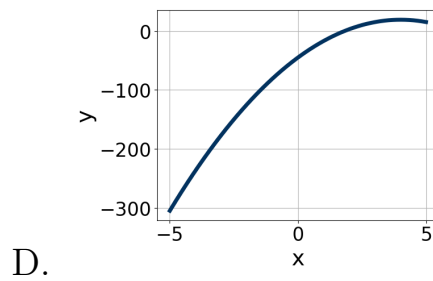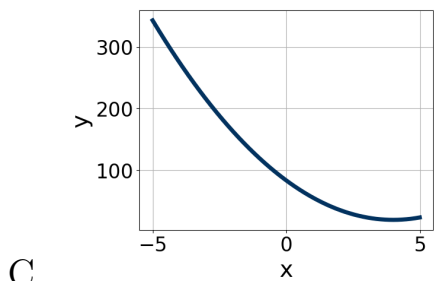
$$54x^2 + 75x + 25$$

A. $a \in [1.5, 3.2]$, $b \in [2, 8]$, $c \in [17.6, 18.16]$, and $d \in [1, 7]$

B. $a \in [0.4, 1.1]$, $b \in [29, 37]$, $c \in [-0.37, 1.43]$, and $d \in [42, 50]$

C. $a \in [23.8, 28.5]$, $b \in [2, 8]$, $c \in [1.52, 4.76]$, and $d \in [1, 7]$

D. $a \in [6.8, 10.1]$, $b \in [2, 8]$, $c \in [5.08, 7.07]$, and $d \in [1, 7]$

E. None of the above.

3. Graph the equation below.

$$f(x) = -(x + 4)^2 + 19$$

A.

B.

C.

D.

E. None of the above.

4. Factor the quadratic below. Then, choose the intervals that contain the constants in the form $(ax + b)(cx + d); b \leq d$.

$$36x^2 - 53x + 10$$

A. $a \in [-2.4, 2.2]$, $b \in [-50, -41]$, $c \in [0.8, 1.6]$, and $d \in [-9, -4]$

B. $a \in [-2.4, 2.2]$, $b \in [-5, 0]$, $c \in [24.3, 30.5]$, and $d \in [-4, 2]$

C. $a \in [1.6, 5.8]$, $b \in [-5, 0]$, $c \in [6.7, 9.1]$, and $d \in [-4, 2]$

D. $a \in [7.1, 8.5]$, $b \in [-5, 0]$, $c \in [2.8, 4.5]$, and $d \in [-4, 2]$

E. None of the above.

5. Write the equation of the graph presented below in the form $f(x) = ax^2 + bx + c$, assuming $a = 1$ or $a = -1$. Then, choose the intervals that $a, b,$ and c belong to.
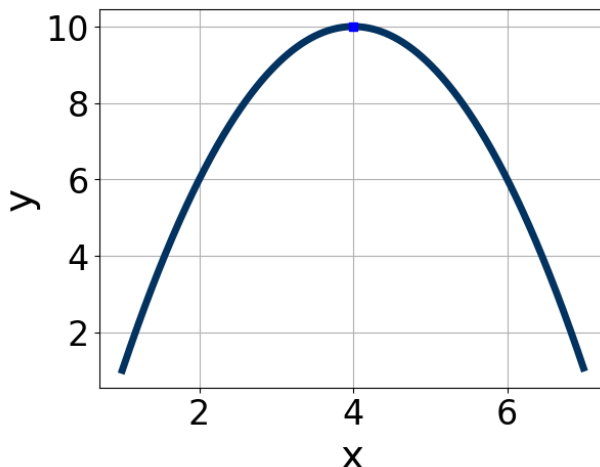
    A. $a \in [-5, 0]$, $b \in [-9, -7]$, and $c \in [-26, -24]$

    B. $a \in [0, 3]$, $b \in [-9, -7]$, and $c \in [25, 28]$

    C. $a \in [-5, 0]$, $b \in [-9, -7]$, and $c \in [-6, -4]$

    D. $a \in [-5, 0]$, $b \in [4, 10]$, and $c \in [-6, -4]$

    E. $a \in [0, 3]$, $b \in [4, 10]$, and $c \in [25, 28]$

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6. Solve the quadratic equation below. Then, choose the intervals that the solutions belong to, with $x_1 \leq x_2$ (if they exist).

$$17x^2 + 7x - 8 = 0$$

    A. $x_1 \in [-15.77, -15.22]$ and $x_2 \in [8.53, 9.44]$

    B. $x_1 \in [-1, -0.62]$ and $x_2 \in [-0.21, 0.71]$

    C. $x_1 \in [-0.7, -0.43]$ and $x_2 \in [0.88, 1.7]$

    D. $x_1 \in [-24.66, -24.53]$ and $x_2 \in [23.87, 25.46]$

    E. There are no Real solutions.

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7. Solve the quadratic equation below. Then, choose the intervals that the solutions belong to, with $x_1 \leq x_2$ (if they exist).

$$-20x^2 - 15x + 6 = 0$$

    A. $x_1 \in [-27.23, -26.85]$ and $x_2 \in [25.7, 27.9]$

    B. $x_1 \in [-5.88, -5.01]$ and $x_2 \in [20.7, 22.9]$

    C. $x_1 \in [-1.21, -0.87]$ and $x_2 \in [0.1, 0.9]$

    D. $x_1 \in [-0.94, 0.48]$ and $x_2 \in [0.7, 2.1]$

    E. There are no Real solutions.

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8. Solve the quadratic equation below. Then, choose the intervals that the solutions x_1 and x_2 belong to, with $x_1 \leq x_2$.

$$15x^2 - 8x - 16 = 0$$

A. $x_1 \in [-12.36, -11.71]$ and $x_2 \in [19.62, 20.69]$

B. $x_1 \in [-1.05, -0.61]$ and $x_2 \in [0.85, 1.75]$

C. $x_1 \in [-4.54, -3.69]$ and $x_2 \in [0.24, 0.3]$

D. $x_1 \in [-0.66, -0.34]$ and $x_2 \in [2.05, 2.76]$

E. $x_1 \in [-2.03, -1.49]$ and $x_2 \in [0.35, 0.69]$

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9. Write the equation of the graph presented below in the form $f(x) = ax^2 + bx + c$, assuming $a = 1$ or $a = -1$. Then, choose the intervals that $a, b,$ and c belong to.
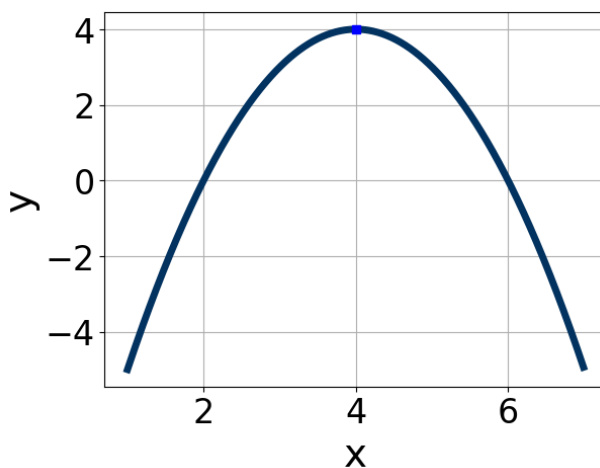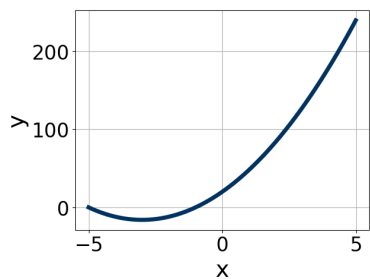

A. $a \in [-2, 0.2]$, $b \in [7, 9]$, and $c \in [-12, -8]$

B. $a \in [-2, 0.2]$, $b \in [-13, -7]$, and $c \in [-12, -8]$

C. $a \in [0.7, 1.1]$, $b \in [-13, -7]$, and $c \in [18, 23]$

D. $a \in [0.7, 1.1]$, $b \in [7, 9]$, and $c \in [18, 23]$

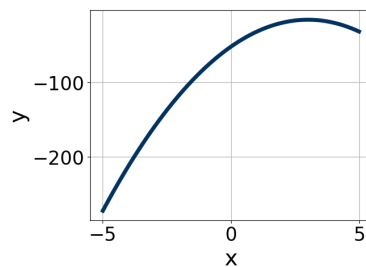E. $a \in [-2, 0.2]$, $b \in [-13, -7]$, and $c \in [-21, -17]$
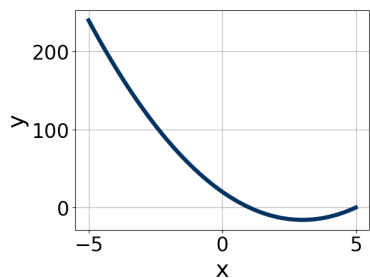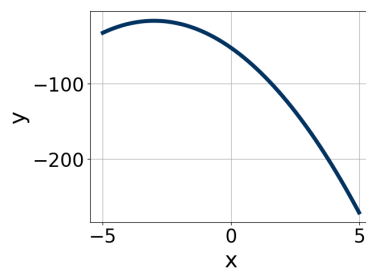
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10. Graph the equation below.

$$f(x) = -(x + 3)^2 - 16$$

A.

C.

B.

D.

E. None of the above.